UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/819,158	03/27/2001	Andrew L. Norrell	PA1690	2663

22830 7590 04/03/2002

CARR & FERRELL LLP
2225 EAST BAYSHORE ROAD
SUITE 200
PALO ALTO, CA 94303

EXAMINER
SWERDLOW, DANIEL

ART UNIT	PAPER NUMBER
2644	

DATE MAILED: 04/03/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/819,158	NORRELL ET AL.	
	Examiner	Art Unit	
	Daniel Swerdlow	2644	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 March 2001* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-17* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-17* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *17 March 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 5 and 10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

3. Claim 5 recites the limitation "the first and second capacitances" in line 2. There is insufficient antecedent basis for this limitation in the claim.

4. Claim 10 recites the limitation "the first and second capacitances" in line 2. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Quarles. Claim 1 claims a load coil comprising a coupled inductor with two windings wrapped about an inductor core with a first capacitive element between the input of the first winding and the output of the second winding and a second capacitive element between the input of the second winding and the output of the first winding. Quarles discloses a load coil comprising a coupled inductor with

two windings wrapped about an inductor core with capacitors connected diagonally across the windings (Fig. 1 and page 1, lines 99-102).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 2, 3 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Quarles in view of Federal Telephone and Radio Corporation.

9. Claim 2 claims the load coil of Claim 1 wherein the capacitive elements have a capacitance in the range of 10 nF to 82 nF. As stated above apropos of Claim 1, Quarles discloses all the elements of that claim. Therefore, Quarles discloses all the elements of Claim 2 with the exception of explicit numerical specification of the capacitance values. Quarles specifies the value of the capacitors as being half of the value to be used between the middle points of the loading coils (page 4, lines 58-64) which is specified to be between .4 and .8 of the total between the wires of one section of the loop. Quarles therefore teaches a value of the capacitors between .2 and .4 of the capacitance of a loop section. Federal Telephone and Radio Corporation teaches that the capacitance of a mile of 24 AWG telephone transmission line is .075 μF (page 111). A 6,000 foot loop section, therefore, has a capacitance of .075(6000/5280) μF which is equal to .085 μF or 85 nF. Hence, the values Quarles teaches are between .2(85)nF and .4(85) nF, that is, between 17 nF and 34 nF. It would have been obvious to one skilled in the

art at the time of the invention to utilize the published values for transmission line capacitance to calculate the capacitances taught by Quarles for the purpose of implementing Quarles's invention.

10. Claim 3 claims the load coil of Claim 1 wherein the capacitive elements have a capacitance in the range of 5 nF to 50 nF. As stated above apropos of Claim 1, Quarles discloses all the elements of that claim. Therefore, Quarles discloses all the elements of Claim 3 with the exception of explicit numerical specification of the capacitance values. As stated above apropos of Claim 2, the combination of Quarles and Federal Telephone and Radio Corporation teach capacitance values of between 17 nF and 34 nF. It would have been obvious to one skilled in the art at the time of the invention to utilize the published values for transmission line capacitance to calculate the capacitances taught by Quarles for the purpose of implementing Quarles's invention.

11. Assuming the limitation in Claim 5 "the first and second capacitances" refers to the first and second "capacitive elements" in Claim 1, Claim 5 claims the load coil of Claim 1 wherein the capacitive elements increase the effective interwinding capacitance of the inductor windings by at least a factor of 5. As stated above apropos of Claim 2, the combination of Quarles and Federal Telephone and Radio Corporation teach capacitance values between 17 nF and 34 nF. Applicant discloses that capacitances in the range of 5 nF to 50 nF increase the effective interwinding capacitance by a factor of five to ten (page 13, lines 15-18). Therefore, it is inherent in the values taught by Quarles and Federal Telephone and Radio Corporation that they increase the effective interwinding capacitance of the inductor windings by at least a factor of 5.

12. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Quarles in view of Baker. Claim 4 claims the load coil of Claim 1 wherein the coupled inductor has an inductance of about 66 mH. As stated above apropos of Claim 1, Quarles discloses all the elements of that claim. Therefore, Quarles discloses all the elements of Claim 4 with the exception of specification of the inductance value. Baker discloses that 66 mH is one of the two most commonly used values for inductors used as loading coils in analog telephone systems (page 2, second heading). It would have been obvious to one skilled in the art at the time of the invention to use a load coil with a common inductance value in the system disclosed by Quarles for the purpose of having a loading coil easily obtainable in forms suitable for use in outside plant telephone installations.

13. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Birck in view of well known prior art (MPEP 2144.03). Claim 6 claims a load coil comprising a coupled inductor having first and second windings with a capacitor in parallel with each winding. Birck teaches a load coil comprising two windings, with a frequency selective device to allow currents above a certain frequency to bypass the loading coil (FIG. 1C and column 3, line 39 through column 4, line 8). The examiner takes official notice that it was well known in the art that a capacitor provides a low impedance path for high frequency signals. It would have been obvious to one skilled in the art at the time of the invention to utilize capacitors in parallel with the loading coil windings of Birck for the purpose of providing the frequency selective device disclosed by Birck.

14. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Birck in view of well known prior art as applied to Claim 6, above. Claim 7 claims the load coil of Claim 6 wherein the first and second capacitive elements have a capacitance in the range of 5 nF to 50 nF. As stated above apropos of Claim 6, the combination of Birck and well known prior art teaches all the elements of that claim. Therefore, Birck teaches all the elements of Claim 7 with the exception of the numerical values for the capacitance of the capacitive elements. It would be obvious to one skilled in the art to select values for the capacitive elements such that the magnitude of the impedance of the capacitive elements would be similar to the resistance of a loop section. Since the resistance of a 6,000 foot length of 24 AWG copper wire is 154 ohms, and the applicant discloses the lower bound of the ADSL signal band to be 26 kHz, an obvious value for the capacitance would be a value, C, such that $1/(2\pi \cdot 26000C)=154\Omega$. This results in a value for C of 40 nF. Therefore, it would have been obvious to one skilled in the art at the time of the invention to utilize capacitors with a value of 40 nF in Birck's load coil system for the purpose of providing a path for signals above 26 kHz to bypass the load coil inductor with an impedance comparable in magnitude to the resistance of the copper loop section.

15. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Birck in view of well known prior art (MPEP 2144.03). Claim 8 claims the load coil of Claim 6 wherein the first and second capacitive elements have a capacitance in the range of 10 nF to 82 nF. As stated above apropos of Claim 6, Birck teaches all the elements of that claim. Therefore, Birck teaches all the elements of Claim 8 with the exception of the numerical values for the capacitance of the capacitive elements. As stated above apropos of Claim 7, it would have been obvious to one

skilled in the art at the time of the invention to utilize capacitors with a value of 40 nF in Birck's load coil system for the purpose of providing a path for signals above 26 kHz to bypass the load coil inductor with an impedance comparable to that of the copper loop section.

16. Assuming the limitation in Claim 10 "the first and second capacitances" refers to the first and second "capacitive elements" in Claim 6, Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Birck in view of well known prior art (MPEP 2144.03). Claim 10 claims the load coil of Claim 6 wherein the capacitive elements increase the effective intrawinding capacitance of the inductor windings by at least a factor of 120. As stated above apropos of Claim 8, Birck in combination with well known prior art teaches a capacitance value of 40 nF. Applicant discloses that capacitances in the range of 5 nF to 50 nF increase the effective intrawinding capacitance by a factor of 100 to 1000 (page 14, lines 16-21). Therefore, it is inherent in the value taught by Birck in combination with well known prior art that it increases the effective intrawinding capacitance of the inductor windings by at least a factor of 120.

17. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Birck in view of Baker. Claim 9 claims the load coil of Claim 6 wherein the coupled inductor has an inductance of about 66 mH. As stated above apropos of Claim 6, Birck discloses all the elements of that claim. Therefore, Birck discloses all the elements of Claim 9 with the exception of specification of the inductance value. Baker discloses that 66 mH is one of the two most commonly used values for inductors used as loading coils in analog telephone systems (page 2, second heading).

It would have been obvious to one skilled in the art at the time of the invention to use a load coil with a common inductance value in the system disclosed by Quarles for the purpose of having a loading coil easily obtainable in forms suitable for use in outside plant telephone installations.

18. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Birck in view of well known prior art (MPEP 2144.03) as applied to Claim 6 above, and further in view of Vittore. Claim 11 claims a system for transmitting DSL and POTS signals comprising a load coil including a coupled inductor and multiple capacitive elements for improving DSL transmission across the coil and a repeater which includes another load coil in series with the load coil to amplify DSL signals. As stated above apropos of Claim 6, Birck in combination with well known prior art teaches all the elements of the first load coil. Vittore discloses a DSL repeater that is selective of DSL signals and amplifies only them (paragraph 11). It would have been obvious to one skilled in the art at the time of the invention to utilize the frequency selective DSL amplifier disclosed by Vittore in the load coil system disclosed by Birck for the purpose of providing the frequency selective element disclosed by Birck. Further, it would have been obvious to one skilled in the art at the time of the invention to utilize the frequency selective amplifier and load coil combination on a loop in addition to the capacitor and load coil combination to provide DSL service on loops in excess of 18,000 feet long (Vittore, paragraph 3).

19. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Birck in view of well known prior art (MPEP 2144.03), and further in view of Vittore as applied to Claim11

above, and further in view of Quarles. Claim 12 claims the system of claim 11 with first and seconds windings capacitive elements disposed diagonally across those windings. As stated above apropos of Claim 11, the combination of Birck, well known prior art and Vittore have all the elements of that claim. Therefore the combination has all the elements of Claim 12 with the exception of the diagonal disposal of the capacitive elements. As stated above apropos of Claim 1, Quarles teaches diagonal disposal of capacitors in a loading coil. It would have been obvious to one skilled in the art at the time of the invention to apply the diagonal disposal of capacitors taught by Quarles to the combination for the purpose of reducing transient distortion.

20. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Birck in view of well known prior art (MPEP 2144.03), and further in view of Vittore as applied to Claim 11, above. Claim 13 claims the system of Claim 11 with first and second windings and capacitive elements disposed in parallel with those windings. As stated above apropos of Claim 11, the combination of Birck, well known prior art and Vittore have all the elements of that claim. Further, as stated above apropos of Claim 6, the combination of Birck and well known prior art have all the additional elements of Claim 13. It would have been obvious to one skilled in the art at the time of the invention to utilize capacitors in parallel with the loading coil windings of Birck for the purpose of providing the frequency selective device disclosed by Birck.

21. Assuming Claim 14 refers to the embodiment wherein the capacitive elements are diagonally disposed, Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Birck in view of well known prior art (MPEP 2144.03), and further in view of Vittore as applied

to Claim 11, above and further in view of Quarles and Federal Telephone and Radio Corporation. Claim 14 claims the system of Claim 11 wherein each capacitive element has a capacitance between 10 nF-82 nF. As stated above apropos of Claim 11, the combination of Birck, well known prior art and Vittore have all the elements of that claim. Therefore, the combination has all the elements of Claim 14 with the exception of the values of the capacitance of the capacitive elements. As stated above apropos of Claim 2, Quarles and Federal Telephone and Radio Corporation teach a value between 17 nF and 34 nF for the diagonally disposed capacitive elements. It would have been obvious to one skilled in the art at the time of the invention to utilize capacitances of the values taught by Quarles in the combination for the purpose of reducing transient distortion.

22. Assuming Claim 14 refers to the embodiment wherein the capacitive elements are disposed in parallel with the inductor windings, Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Birck in view of well known prior art (MPEP 2144.03), and further in view of Vittore as applied to Claim 11, above. Claim 14 claims the system of Claim 11 wherein each capacitive element has a capacitance between 10 nF-82 nF. As stated above apropos of Claim 11, the combination of Birck, well known prior art and Vittore have all the elements of that claim. Further, as stated above apropos of Claim 7, Birck and well known prior art teach the use of a value of 40 nF for the capacitive elements. It would have been obvious to one skilled in the art at the time of the invention to utilize capacitances of the value taught by Birck and well known prior art in the combination for the purpose of providing a path for signals above 26 kHz

to bypass the load coil inductor with an impedance comparable in magnitude to the resistance of the copper loop section.

23. Assuming Claim 15 refers to the embodiment wherein the capacitive elements are diagonally disposed, Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Birck in view of well known prior art (MPEP 2144.03), and further in view of Vittore as applied to Claim 11, above and further in view of Quarles and Federal Telephone and Radio Corporation. Claim 15 claims the system of Claim 11 wherein each capacitive element has a capacitance between 5 nF-50 nF. As stated above apropos of Claim 11, the combination of Birck, well known prior art and Vittore have all the elements of that claim. Therefore, the combination has all the elements of Claim 15 with the exception of the values of the capacitance of the capacitive elements. As stated above apropos of Claim 2, Quarles and Federal Telephone and Radio Corporation teach a value between 17 nF and 34 nF for the diagonally disposed capacitive elements. It would have been obvious to one skilled in the art at the time of the invention to utilize capacitances of the values taught by Quarles in the combination for the purpose of reducing transient distortion.

24. Assuming Claim 15 refers to the embodiment wherein the capacitive elements are disposed in parallel with the inductor windings, Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Birck in view of well known prior art (MPEP 2144.03), and further in view of Vittore as applied to Claim 11, above. Claim 15 claims the system of Claim 11 wherein each capacitive element has a capacitance between 5 nF-50 nF. As stated above apropos of

Claim 11, the combination of Birck, well known prior art and Vittore have all the elements of that claim. Further, as stated above apropos of Claim 7, Birck and well known prior art teach the use of a value of 40 nF for the capacitive elements. It would have been obvious to one skilled in the art at the time of the invention to utilize capacitances of the value taught by Birck and well known prior art in the combination for the purpose of providing a path for DSL signals to bypass the load coil inductor with an impedance comparable in magnitude to the resistance of the copper loop section.

25. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Birck in view of well known prior art (MPEP 2144.03). Claim 16 claims a load coil comprising inductive means for conditioning POTS signals and capacitive means for allowing DSL signals to bypass the load coil. Birck teaches a load coil comprising inductive means, with a frequency selective device to allow currents above a certain frequency to bypass the load coil (FIG. 1C and column 3, line 39 through column 4, line 8). The examiner takes official notice that it was well known in the art that capacitive means provide a low impedance path for high frequency signals. It would have been obvious to one skilled in the art at the time of the invention to utilize capacitors in parallel with the loading coil windings of Birck for the purpose of providing the frequency selective device disclosed by Birck.

26. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Birck in view of well known prior art (MPEP 2144.03) as applied to Claim 6 above, and further in view of Vittore. Claim 17 claims a system for transmitting DSL and POTS signals comprising a load

coil means including inductive means and capacitive means for improving DSL transmission across the load coil and DSL amplification means to amplify DSL signals. As stated above apropos of Claim 6, Birck in combination with well known prior art teaches all the elements of the load coil means. Vittore discloses a DSL repeater that amplifies DSL signals (paragraph 11). It would have been obvious to one skilled in the art at the time of the invention to utilize the DSL amplifier disclosed by Vittore on a loop in addition to the capacitor and load coil combination taught by Birck and well known prior art to provide DSL service on loops in excess of 18,000 feet long (Vittore, paragraph 3).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel Swerdlow whose telephone number is 703-305-4088. The examiner can normally be reached on Monday through Friday between 8:00 AM and 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Forrester Isen can be reached on 703-305-4386. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9314 for regular communications and 703-872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-4700.

ds
March 29, 2002

FORESTER W. ISEN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600